

Dear spokesperson,

The Workshop on the Intermediate Neutrino Program (WINP) will be held at Brookhaven National Laboratory on February 4–6, 2015. The workshop organizers request that you fill out the enclosed template for describing your experimental plans by January 12, 2015 at 17:00 EST. These templates will be posted on the public WINP website and are intended to facilitate discussion on the best opportunities for neutrino experiments or R&D that can be accomplished in the intermediate time period (~5–10 years) at reasonable cost. Working group conveners may need input from you on an earlier time scale.

Steve Kettell
For the Organizing Committee

1. Name of Experiment/Project/Collaboration: OscSNS
2. Physics Goals
 - a. Primary: [nuebar appearance](#)
 - b. Secondary: [numu & nue disappearance & neutrino cross sections](#)
3. Expected location of the experiment/project: [SNS at ORNL](#)
4. Neutrino source: [SNS spallation target, a lower energy DAR source](#)
5. Primary detector technology: [liquid Cherenkov detector with phototubes](#)
6. Short description of the detector: [8m diameter x 20.5m long cylindrical detector filled with ~880 tons of oil and covered by ~4K 8" phototubes.](#)
7. List key publications and/or archive entries describing the project/experiment. [arXiv:1307.7097](#)
8. Collaboration
 - a. Institution list: [see arXiv:1307.7097](#)
 - b. Number of present collaborators: [~30](#)
 - c. Number of collaborators needed: [~60](#)
9. R&D
 - a. List the topics that will be investigated and that have been completed: [near completion on neutrino flux simulation, have investigated and continuing to investigate beam neutron background \(in conjunction with COHERENT\), oil composition, and choice of phototube](#)
 - b. Which of these are crucial to the experiment: [neutrino flux, oil and phototubes are crucial](#)
 - c. Time line: [~3 years construction after approval and funding](#)
 - d. Benefit to future projects: [OscSNS can make a definitive statement about short-baseline neutrino oscillations and the existence of lower mass sterile neutrinos \(~eV² scale\), opening up a new field of neutrino physics.](#)
10. Primary physics goal expected results/sensitivity:
 - a. For exclusion limit (such as sterile neutrino search), show 3-sigma and 5-sigma limits: [see Fig. 2.3 of arXiv:1307.7097](#)
 - b. For discovery potential (such as the Mass Hierarchy), show 3-sigma and 5-sigma: [see Fig. 2.3 of arXiv:1307.7097; OscSNS covers LSND signal by ~10 sigma after 6 years of data](#)
 - c. For sensitivity plots, show 3-sigma and 5-sigma sensitivities: [see Fig. 2.3 of arXiv:1307.7097 \(note that for neutrino-less double beta decay experiments that have previously been asked for 90% CL and 5 sigma limits these are OK\)](#)

- d. List the sources of systematic uncertainties included in the above, their magnitudes and the basis for these estimates: **intrinsic nuebar from mu- DAR (0.1%) ; however, this background has a unique energy spectrum and can be measured**
- e. List other experiments that have similar physics goals: **SBN, J-PARC**
- f. Synergies with other experiments: **the entire proposed neutrino program at the SNS depends upon the same neutrino flux estimate and neutron background measurement. There is a dedicated group of people from OscSNS and COHERENT who are working together on these items.**

11. Secondary Physics Goal

- a. Expected results/sensitivity: **can observe oscillations in the detector for nue and numu disappearance >5%**
- b. List other experiments that have similar physics goals: **SBN, MINOS+, reactor & source experiments**

12. Experimental requirements

- a. Provide requirements (neutrino source, intensity, running time, location, space,...) for each physics goal: **OscSNS needs 2 years of running time at the SNS initially to test the LSND signal. We will need to build an underground detector hall to house the detector. Space is available at the SNS that meets our needs. We have already had a preliminary site survey and construction estimate completed, by an engineering company that has done a lot of work at the SNS.**

13. Expected Experiment/Project time line

- a. Design and development: **1 year duration**
- b. Construction and Installation: **2 year duration**
- c. First data: **3 years from approval and funding start**
- d. End of data taking: **2 years duration**
- e. Final results: **5 years from approval and funding start**

14. Estimated cost range

- a. US contribution to the experiment/project: **~\$20M**
- b. International contribution to the experiment/project: **? unkown at this time, due to preliminary nature of experiment**
- c. Operations cost: **\$50K/year**

15. The Future

- a. Possible detector upgrades and their motivation: **build a second detector for OscSNS. The SNS is considering plans to build a second spallation target (aka neutrino source), allowing OscSNS to perform measurements using two baselines.**
- b. Potential avenues this project could open up: **enlarged neutrino oscillation paradigm; measurement of other sources of CP violation**